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Arnold Schwarzenegger
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February 2, 2005

Commanding Officer
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Naval Facilities Engineering Command
Southwest Division
1220 Pacific Highway
San Diego, CA 92132-5190
Attention: Keith Forman

DRAFT SOIL GAS SURVEY WORK PLAN, DECEMBER 23, 2004, HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Dear Mr. Forman:

Thank you for the opportunity to review the draft Soil Gas Survey Work Plan for Installation Restoration Sites 7 and 18 in Parcel B. The attached comments were written in light of the recent guidance by the Department of Toxic Substances Control (DTSC) Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, December 15, 2004. Soil vapor guidance of the California Integrated Waste Management Board and the Regional Water Quality Control Board were also consulted in preparation of these comments.

One concern expressed in the attached comment letter is that soil gas analysis is limited to methane. The history of Sites 7 and 18 as disposal sites and the concern for vapor intrusion into future structures warrants the inclusion of some non-methane organic compounds in soil gas analysis. We would like to discuss this request with the Navy prior to the issuance of the Final Work Plan.

If you have any questions regarding these comments please contact me at (510) 540-3776.

Sincerely,

Thomas P. Lanphar
Senior Hazardous Substance Scientist
Office of Military Facilities

Mr. Keith Forman
February 2, 2005
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**DTSC Comments on the
Draft Hunters Point Parcel B Soil Gas Survey Work Plan
December 23, 2004**

- 1) Analytical Program. IR07 and IR18 comprise a large area (17 acres) which was operated as an unregulated disposal area (i.e., "landfill", page C.3-1) for many years. Releases of waste oil were ongoing--at least through Triple A tenure at the site. Very elevated concentrations of total petroleum hydrocarbons (TPH) and other compounds have been measured in the soil. Areas underlying occupied property or adjacent to occupied property have not been fully investigated. Moreover, human health risks for the vapor intrusion pathway are associated with very low concentrations of compounds in soil gas--e.g., naphthalene, benzene, and vinyl chloride. These facts all suggest that a broader analytical program is warranted. However, analysis for methane only is proposed in the SGMP (i.e., field analysis). DTSC requests that, at the minimum, occupied areas, areas adjacent to occupied areas, and areas planned for non-open space development be sampled for additional landfill gases (LFGs) and a broader suite of VOC contaminants. Please include: LFGs (i.e., O₂, CO, CO₂, H₂S, NH₃), TPH, volatile organic compounds (VOCs), fuel oxygenates--and radon and other radiological contaminants as required by the Department of Health Services (DHS).

Please provide a revised list of all analytes for agency review, with analytical method, preservation (if any), holding times, etc.

- 2) Please include detection limits (DLs) in soil gas for all analytes. For VOCs, DLs should be consistent with California Human Health Screening Levels (CHHSLs) for soil gas developed by the Office of Environmental Health Hazard Assessment (OEHHA). CHHSLs are presented in: Use of California Human Health Based Screening Levels in Evaluation of Contaminated Properties (CalEPA, January 2005) at: <http://www.calepa.ca.gov/Brownfields/documents/2005/CHHSLsGuide.pdf>. DLs for inorganics are provided in the AASG (see below). If proposed DLs are higher than CHHSLs because of an assumed alpha (indoor air concentration/soil gas concentration), a discussion on alphas should be provided. Default alphas provided in DTSC guidance (see next comment) for residential land use should be used.
- 3) Guidance documents. Please ensure that the SGMP is consistent with the following guidance documents, some of which have been recently released or revised.
 - a) Advisory - Active Soil Gas Investigations (AASG). DTSC and Regional Water Quality control Board, Los Angeles Region (LARWQCB). January 28, 2003. http://www.dtsc.ca.gov/PolicyAndProcedures/SiteCleanup/SMBR_ADV_activesoilgasinvst.pdf. This document contains methodologies for soil gas sampling.
 - b) Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (VIG, for vapor intrusion guidance). DTSC. December 15, 2004. This document contains soil gas monitoring protocols that ensure the data collected is appropriate for risk assessment of the air intrusion pathway. This guidance is expected to be posted on the DTSC website in the near future. Electronic copies were forwarded to the Navy on January 11, 2005.
 - c) The California Integrated Waste Management Board's (IWMB's) Guidance for Inspecting Closed, Illegal and Abandoned Disposal Sites for State Minimum Standards (Draft, January 7, 2002) and other guidance should also be

considered. IWMB guidance is available at:

<http://www.ciwmb.ca.gov/leacentral/cia/Inspection/draft.pdf>.

- d) Any soil matrix samples that are collected must follow the recommendations in: Guidance Document for the Implementation of United States Environmental Protection Agency Method 5035: Methodologies for Collection, Preservation, Storage, and Preparation of Soils to be Analyzed for Volatile Organic Compounds. DTSC, November 2004, at: http://www.dtsc.ca.gov/PublicationsForms/HWMP_Guidance_Method-5035.pdf.
- 4) Sample density. The SGWP proposes Phase I regular grid sampling over IR07 and IR18 with grid nodes 100 feet apart (Figure 4-1). Several options for Phase II stepout sampling over a tighter grid are also discussed (page 4-4). Phase I sampling density is equivalent to one sample per 10,000 square feet (i.e., one sample per quarter acre). This is adequate for a preliminary areal investigation for methane and VOCs. However, higher sampling density is warranted in some areas - for example (e.g., Comments 6 and 7): in occupied areas, along utilities, and at locations where VOCs were released, stored, or transported.
- a) Sampling density is based on the size of an occupied lot: what are estimated residential and industrial lot sizes for future development in this area?
 - b) Sampling density is based on land uses (as noted above). Please include current and future land uses on figures that show proposed sampling locations.
 - c) Identify sampling locations using a geographical positioning system (GPS).
 - d) Use GPS locations as identification numbers for samples.
- 5) Sampling depths
- a) Sampling depths "about five feet" below the ground surface (5 fbgs) are proposed. Sampling depths should be less than 5 fbgs because ambient air intrusion into sampling equipment (i.e., aka "short-circuiting") dilutes samples. And, diurnal cycling (which also dilutes samples) extends to 5 fbgs. However, if site conditions are such that sampling at less than 5 fbgs is unavoidable, please provide justification on a location-specific basis. In addition, describe actions taken to prevent short-circuiting.
 - b) 3-D characterization of soil gas (from ground surface to groundwater table) is required. Please collect deeper samples at 5-foot intervals. Refer to IWMB guidance regarding depths of sampling points.
 - c) The depth of soil gas sampling is limited by the depth of the groundwater table. Please include a figure showing groundwater level contours.
- 6) Site History. Sampling locations may be dictated by site uses. For example, grid sampling should be supplemented by biased sampling in areas where releases are known to have occurred. In order to determine if biased sampling is warranted, DTSC request that the site histories for IR07 and IR18 are discussed in more detail. Please depict site uses for IR07 and IR18 and adjacent areas on a figure, including: USTs, ASTs, and areas of known VOC release, disposal, use, and storage.
- 7) Utilities and other site features. In addition to grid sampling, biased sampling is also indicated, as discussed below.

- a) Because of the complex history of the site, and because site history is poorly documented, a soil gas walk-over survey is requested. A walk-over survey will identify locations with elevated results and candidates for biased sampling. Refer to IWMB guidance regarding walk-over surveys.
 - b) To evaluate whether preferential pathways exist, please collect samples along utility lines and corridors and at other selected locations (i.e., vaults and subsurface structures). Please collect samples at utilities: 1) in occupied areas; 2) in areas close to occupied areas (including property and parcel boundaries); and 3) in areas where future occupancy is planned. As an example of the pertinence of this comment, consider that: on Parcel E, high concentrations were first discovered at a light pole, on occupied property of the University of California at San Francisco (UCSF).
 - c) Please provide a figure that shows all current and historic utilities (including fuel lines) on IR07 and IR18 and adjoining areas, including adjacent properties. Railroad lines and spurs should also be indicated to determine if railroad ballast acts as a conduit for gas.
 - d) Please sample all vaults and other subsurface features, since these may be accumulation areas for methane and other LFGs. Please show all subsurface features on a site figure.
 - e) Figures indicate that no buildings currently occupy IR07 and IR18. However, historic buildings likely had utility hookups: hence, preferential pathways may be associated with former buildings. Please indicate the location of all former buildings on figures (e.g., Buildings 18 through 24, 100, 158, 916, 917, etc.).
 - f) Surfaces (e.g., parking lots) can influence gas accumulation and migration characteristics. Please show surface condition on a figure.
 - g) Please discuss (and show on a figure) all other physical features that may be associated with areas of potential concern (AOPCs) for vapor intrusion. A list of AOPCs is provided in VIG, page 3.
 - h) Areas in or adjacent to excavations may have low-biased methane readings since oxygen (aerobic) conditions will destroy methane producing bacteria (which may take some time to re-establish). Therefore, please identify areas that have been excavated and backfilled. Please indicate if any excavations are currently open.
 - i) Please include all other ground penetrations that are potential conduits for LFG (e.g., wells, piezometers) on a figure.
- 8) Methane "pockets". The SGWP sampling density was designed to detect plumes "with a radius of 65 feet or greater" (page 4-3). As investigations on Parcel E (and elsewhere) have shown, methane "pockets" with smaller radii may exist: such pockets are also a cause for concern. Sampling density greater than that proposed will be required to detect and monitor methane pockets—especially in or adjacent to occupied areas. A walk-over survey, along with- additional biased sampling locations, may help to address this concern. Please describe how the potential for methane "pockets" will be addressed.
- 9) Wet conditions.
- a) Figure 1-2 indicates that Phase I soil gas sampling is scheduled for March 7 to 11, 2005 and Phase II, for April 20 to 26. Sampling during the rainy season will

result in low-biased results. Depending on the weather, the field schedule may need to be adjusted.

- b) Because of natural variations due to climatic cycles, one sampling event is likely not sufficient. Phase III sampling during dry season may be required.
- c) Soil gas sampling should not be conducted during or immediately after a significant rainfall event (e.g., one-half inch), or after onsite watering for any purposes (e.g., dust control, irrigation). After prolonged rainfalls, more time may be required before sampling for soil gas.
- d) Please include specifications for climatic conditions in the SGWP (e.g., sampling can not be scheduled during or immediately after rainfall).
- e) Include a rainfall hydrograph with the data report.

10) Installation of Temporary Borings and Soil Gas Measurement Procedures (pages 4-4 and A.6-1). The text references AASG, as appropriate. A brief description of soil gas sampling using direct push technology (DPT) is included. However, not enough detail is provided to determine whether the proposed field work is fully consistent with AASG and other guidance. And, in some cases, departures from the guidance were noted. The following comments include specific examples from guidance documents.

- a) Please include purge tests in the SGWP. The AASG says: "To ensure stagnant or ambient air is removed from the sampling system and to assure samples collected are representative of subsurface conditions, a purge volume versus contaminant concentration test should be conducted as the first soil gas sampling activity at the selected purge test point." (page 8) Record purge test data on a field form and include all purge test data in the data report.
- b) The text says: "the measurement assembly will be purged for 30 seconds". This protocol is not consistent with the AASG which requires purge volumes to be specified, as follows: 1) purge volume should be based on the maximum concentrations measured in the purge test; 2) a default of 3 volumes can be selected if VOCs are non-detected; and 3) the purge test rate should be 100 to 200 ml/min. Please include the following location-specific information in the data report: the volume of the measurement assembly, purging and sampling rates, and purging and sampling volumes. Additional protocols are provided in AASG Section 2.3.
- c) Describe how flow rates will be measured and adjusted in the field. Provide justification for each purging or sampling rate in excess of 100 to 200 ml/min.
- d) A purge test location should be selected "as near as possible to the source". However, because IR07 and IR18 are very heterogeneous, one test location is not sufficient. Testing at each location is recommended. At a minimum, please conduct purge tests at locations adjacent to current or future occupied property.
- e) Please conduct leak tests at each soil probe according to protocols described in AASG Section 2.4. Please describe leak tests and specify tracer compounds in the SGWP. Record results of leak tests on field forms.
- f) Please collect samples on the intake side of the sampling pump to prevent contamination from the pump.
- g) Methane sampling programs are discussed in AASG Section 2.7.9. Sampling programs for other target compounds are discussed in AASG Section 2.7.8.

- h) Please summarize manufacturer and field calibration requirements for all instruments, including Gem 2000. Include a description of all field calibrations required: discuss conditions that warrant field calibration. Include calibration records in the data report.
- i) Do not use ambient air to zero the instrument. However, please include ambient air readings for each location in the data report.
- j) Ambient air must not be used to purge the measurement assembly. Please ensure that clean gas is used and include specifications for the clean gas used for this purpose in the report.
- k) Please include temperature readings for each location. If the Gem 2000 will be used for temperature readings, a temperature probe is required.
- l) Please include a diagram of the "measurement assembly", with vacuum gauge, sampling port, water trap, Gem 2000, et cetera.
- m) When a hand-held instrument is used to analyze methane samples, DTSC recommends confirmation of at least 10 percent of all positive methane samples. Confirmation can be accomplished by using another hand-held instrument (different unit or brand) or by a GC method. At IR07 and IR18, 100% confirmation of all samples is strongly recommended for locations in or adjacent to occupied property.
- n) Include a description of the operating principles of the CES-Landtec Gem™ 2000 which utilizes an infrared (IR) technology to analyze for combustible gases and a galvanic sensor to analyze for O₂. Include a figure showing basic components of each sensor, with detector types for various gases, optional gas pods, temperature pod, water trap, dry filter, particulate filter, et cetera.
- o) Please identify all other gases that will be adsorbed within the IR spectrum of methane and, hence, be reported as methane. Identify additional gas pods that will be used. Discuss typical accuracy and detection limits for various scales and various gases.
- p) Please discuss ambient temperatures and relative humidity ranges for proper functioning of equipment and include field protocols to ensure appropriate temperatures and humidity are maintained.
- q) Please specify detection limits (DLs) as in described in AASG Section 2.7.3, and as discussed in comment 2 above.
- r) The inner soil gas pathway from probe tip of the DPT rig to the surface should be sealed around the drive rod to prevent infiltration (e.g., a sampling tube attached to a screw adapter fitted with an o-ring and connected to the probe tip). Please ensure that the drive rod is sealed and include a drawing of the temporary boring.
- s) Please include a description of (or product brochure for) the DPT rig.
- t) If refusal occurs, please follow the recommendations in AASG Section 2.64.
- u) Please identify how lithological descriptions will be provided at each location.
- v) Please backfill at soil gas locations with bentonite grout using a tremie pipe. Do not use "bentonite hydrated in 2.5 foot lifts". Include grout specifications.
- w) Please include a list of all equipment to be taken into the field (e.g., calibration equipment, extra filters for water traps and other backup equipment).
- x) Identify all parameters (and units) to be measured in the field at each location. In the SGWP, include an example field form to be used for recording all field data.

- y) In the SGWP, please include an example spreadsheet showing all data to be downloaded from the Gem 2000. Identify all parameters (with units) to be measured and recorded by the equipment, including "questions".
 - z) For air vapor intrusion assessment, soil parameters may be needed, including soil density, soil organic carbon content, soil moisture, effective permeability, porosity, and grain size distribution analysis. These analyses may be collected at a later stage of investigation. If and when these soil parameters are determined, DTSC requests that locations and depths of samples be proposed for agency concurrence.
- 11) Applicable or relevant and appropriate requirements (ARARs) were not all identified. Additional ARARs are provided in the next few comments. In addition, California requirements regarding releases and waste disposal areas and Resource Conservation and Recovery Act (RCRA) requirements should be reviewed.
- 12) Recommendations made by the IWMB with respect to previous soil gas investigations (on Parcel E) may apply also to this investigation, since the sites have several commonalities including site history as unregulated disposal locations and adjacent occupied properties. For example, IWMB normally recommends that as a condition of transfer of parcels to non-Department of Defense ownership, any proposed future development within 1,000 feet of landfill footprints be required to comply with the standards contained in §21190. IWMB laws and regulations (e.g., Title 27 and portions of the Public Resource Code) should be considered as applicable or relevant and appropriate requirements (ARARs). More information is available at the IWMB website: <http://www.ciwmb.ca.gov/Regulations/>.
- 13) All engineering or geological work should be performed by or supervised by a California Registered Professional in accordance with the Business and Professions Code, Chapters 7 and 12.5 and the California Code of Regulations, Title 16, Chapters 5 and 29. This requirement applies to all contractors and consultants of the Navy. Please confirm that all persons with responsible charge for this project have the required qualifications. All reports (including this work plan) should be signed and stamped accordingly.
- 14) The Health and Safety Plan (HASP) should be compliant with the requirements of the CalOSHA hazardous waste and emergency response operations standard [(HAZWOPER) (8 CCR 5192)]. Regulations, codes and standards applicable to site activities described within a HASP often extend beyond this standard and include a diverse body of regulations, codes and standards. Effective implementation and regulatory compliance are the employer's responsibilities.

To assist contractors, subcontractors and responsible parties in preparing site-specific HASPs, DTSC has developed a draft guidance document, which is available upon request. Detailed review of the HASP review is outside the scope of this memorandum. However, a few comments are provided below.

- a) A material safety data sheet (MSDS) should be provided for methane.
- b) The text says (page C.7-1): "A photoionization detector (PID) or a flame ionization detector (FID) will be used to determine the presence and

- concentration of organic vapors.” (Emphasis added) PIDs can not be used to detect methane, but can detect other LFGs: FIDs will readily detect methane.
- c) Please include the specific equipment to be used for health and safety monitoring, and revise the SGWP accordingly (e.g., sections related to borehole and breathing zone sampling, and Activity Hazard Assessment on page 4). Include product information sheets, with DLs, ranges, sensitivities, et cetera.
 - d) Calibration gases should be specified: the word “usually” in front of isobutylene (for the PID) and methane (for the FID) should be deleted from page C.7-2.
 - e) UV lamp type (in eV) for the PID should be specified.
 - f) O₂ deficient atmospheres should be specifically discussed: O₂ action levels should be included.
 - g) Upper and lower explosive limits (UEL and LEL) for methane should be discussed.
 - h) Breathing zone readings should be taken at each location (not only if borehole readings exceed 10 ppm). Record all HASP field readings on field forms.
 - i) Backup monitoring equipment should be taken into the field.
 - j) Methane should be listed among compounds previously measured on the site (Solid Waste Air Quality Assessment Test (SWAT): August 4, 1989).
 - k) Asbestos should be addressed in the text of the HASP and in the AHA sections.
- 15) Please provide justification for the statement that only “thin” layers of sandblast grit were found at IR07 and IR18 (pages ES-1, 2-1). The “Sand Blasting Area”, the “Sand Blast Pit”, and the “Additional Area” were large--comprising acres. Moreover, the distribution of elevated metals at the site indicates that the extent of sandblast grit (both black and white) was extensive, continuing into the Bay, and that thicknesses were substantial.
- 16) Please identify the location of the decontamination area.
- 17) Quality assurance/quality control (QA/QC) samples or protocols are not discussed for field samples for LFG. Please include QA/QC for field samples for LFG (i.e., methane and other analytes). QA/QC described in Appendix A applies only to wastewater samples collected for disposal: review of QA/QC for waste water samples is deferred to USEPA.
- 18) Revise data quality objectives (DQOs) to reflect these comments.
- 19) HASP Appendix D: IR-07/18 Soil Gas Survey Radiological Support Work Instruction was not included. Sections related to radiological contamination are referred to the Department of Health Services (DHS).
- 20) Investigation derived waste (IDW). Please identify IDW storage locations (and show on a figure), transporters, and disposal sites.
- 21) Typos. Should “magnahelic” and “magnahelix” be “Magnehelic®”?